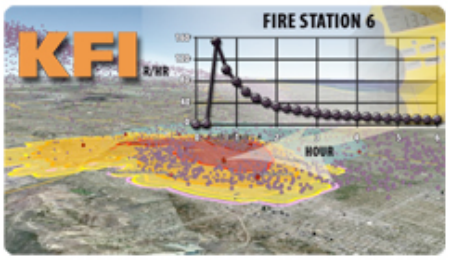
LAWRENCE LIVERMORE
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Feb. 14-18, 2011

Journey to the center of a building



In this model, LLNL scientists track fallout cloud movement and radiation levels on the ground for the city of Los Angeles. The graph displays estimated doses over time for Fire Station 6.

If a terrorist unleashes an improvised nuclear device, also known as an IND or dirty bomb, in a large city like Los Angeles, there is a way to survive with little exposure to radiation.

According to LLNL health physicist Brooke Buddemeier many lives can be saved in the wake of a nuclear explosion with appropriate planning and preparedness.

That's the message that he delivers to state and local officials and emergency responders to help prepare for such an attack.

KFI radio recently interviewed Buddemeier who discussed how to survive the fallout from a nuclear blast. He said people exposed to the explosion could survive if they took cover in a basement, parking garage or the center of a building "to avoid the exposure from those fallout particles that gather on horizontal surfaces, rooftops and roadways," he said.

To hear the full interview, go to the Web.

It sure doesn't smell like gasoline

One of the Lab's hydrogen buses.

In fact, it doesn't smell at all. That's because the buses on display this coming Tuesday in downtown Livermore are powered by hydrogen, an odorless energy source. LLNL and Sandia national laboratories will showcase two buses, now operating at both Livermore sites, at 11 a.m. Tuesday, Feb. 22. The collaborative effort is part of a strategy for an energy sustainable future and cleaner environment.

The public is welcome to stop by and take a ride. Scientists will be on hand to answer questions about hydrogen technology and energy research conducted at the laboratories. In addition, a hydrogen-powered Toyota Prius equipped with a cryogenic tank will be on display, as well as a fuel cell mobile lighting system.

Leased from the Ford Motor Company, the buses use internal combustion engines, but are a bridge to vehicles that will use hydrogen fuel cells.

The project is funded by the Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy /Fuel Cell Technologies Program. The DOE is actively engaged in market transformation efforts to demonstrate hydrogen technologies and educate the public about the safety, energy security and environmental advantages of hydrogen as a transportation fuel.

The buses will be on display in the parking lot adjacent to the Bankhead Theater, 2400 First St., downtown Livermore.

40 years down the road

Imagine the energy makeup of the nation 40 years into the future. More electric powered vehicles than gasoline powered. More solar- and wind-generated electricity than from the coal fired power plants of today.

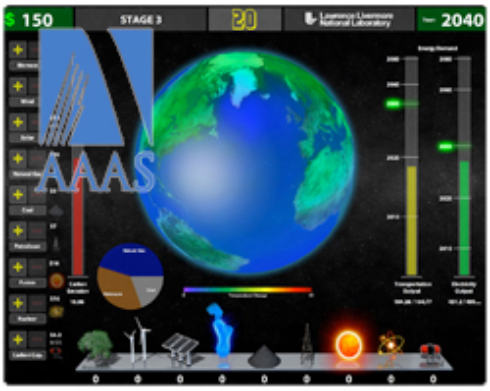
All these alternative energies and more could be on the horizon in the next 40 years. And it's something the Lab's Jane Long is taking seriously.

Long is leading a team of a team of 50 scientists, engineering and utility professionals to create a study titled, "California's Energy Future." Their task: determine if and how California could reduce its carbon emissions 80 percent below 1990 levels by 2050, in line with an executive order issued by then-Gov. Arnold Schwarzenegger.

The team says reductions at this level will likely be required to keep atmospheric CO2 in the 350 to 450 parts per million range in 2050, what most climate scientists say is needed to prevent runaway global warming. The latest measure of CO2 in the atmosphere recorded at the Mauna Loa Observatory was about 391 ppm, taken at the end of January.

To read more, go to the Web.

Show and tell



The Laboratory is showcasing its work in energy research this week as the American Association for the Advancement of Science holds its annual gathering at the Walter E. Washington Convention Center in Washington, D.C.

This year's theme, "Science Without Borders," integrates interdisciplinary science -- both across research and teaching -- that utilizes diverse approaches as well as demonstrates the diversity of its practitioners.

The Laboratory's exhibit features an energy-related theme with two major components. The first includes a 3D virtual ride on a beam of light as it barnstorms through the National Ignition Facility (NIF) -- the world's largest laser system -- and smashes into a BB-sized target filled with fusion fuel, all in a quest to develop fusion as a future energy source.

The second area focuses on finding solutions for the energy-climate challenge. Visitors can try out a simulation developed by LLNL scientists as a learning tool about energy and climate change. Players face the challenge of meeting the world's 21st century energy demands on a fixed budget while keeping carbon emissions at a minimum.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.
To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.
The Livermore Lab Report archive is available on the Web.